

## RF Exposure Report

**Report No.:** SA181019C22

**Test Model:** NCA-1515A

**Series Model:** NCA-1515xxxxxxx, LUNA-D200xxxxxxx (Where x can be 0-9, A-Z, a-z, any alphanumeric character or blank)

**Received Date:** Oct. 19, 2018

**Test Date:** Nov. 17 ~ Nov. 23, 2018

**Issued Date:** Nov. 30, 2018

**Applicant:** Compex Systems Pte Ltd

**Address:** No. 9 Harrison Road, Harrison Industrial Building #05-01, Singapore 369651

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

**FCC Registration/  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
SA181019C22	Original release	Nov. 30, 2018

## 1 Certificate of Conformity

**Product:** Network Appliance Platform

**Brand:** Lanner

**Test Model:** NCA-1515A

**Series Model:** NCA-1515xxxxxxx, LUNA-D200xxxxxxx (Where x can be 0-9, A-Z, a-z, any alphanumeric character or blank)

**Sample Status:** Engineering sample

**Applicant:** Compex Systems Pte Ltd

**Test Date:** Nov. 17 ~ Nov. 23, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** Celine Chou , **Date:** Nov. 30, 2018  
Celine Chou / Senior Specialist

**Approved by :** Bruce Chen , **Date:** Nov. 30, 2018  
Bruce Chen / Project Engineer

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi$  = 3.1416

$r$  = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result of Maximum Tune up Power

For WLAN: (Base on WLAN module report (Model: AP6356SDPB, FCC ID: ZQ6-AP6356SDXX))

Frequency Band (MHz)	TX Funtion	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN: 2.4GHz Band	1TX	14.15	1.60	20	0.007	1
	2TX	14.91	4.61	20	0.018	1
WLAN: 5GHz Band	2TX	12.84	4.95	20	0.012	1

Note:

2.4GHz: Directional gain = 1.60dBi + 10log(2) = 4.61dBi

5GHz: Directional gain = 1.94dBi + 10log(2) = 4.95dBi

For WLAN: (Base on WLAN module report (Model: WLE600VX, FCC ID: TK4WLE600VX))

Frequency Band (MHz)	TX Funtion	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN: 2.4GHz Band	1TX	22.26	1.60	20	0.048	1
	2TX	24.22	4.61	20	0.152	1
WLAN: 5GHz Band	1TX	21.89	1.94	20	0.048	1
	2TX	24.63	4.95	20	0.181	1

Note:

2.4GHz: Directional gain = 1.60dBi + 10log(2) = 4.61dBi

5GHz: Directional gain = 1.94dBi + 10log(2) = 4.95dBi

For WWAN: (Base on WWAN module report (Model: EM7455, FCC ID: N7NEM7455))

Function	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WCDMA Band 2	1852.4-1907.6	23.64	1.56	20	0.066	1
WCDMA Band 4	1712.4-1752.6	23.45	1.62	20	0.064	1
WCDMA Band 5	826.4-846.6	23.51	3.20	20	0.093	0.550
LTE Band 4	1720.0-1745.0	23.99	1.62	20	0.072	1
LTE Band 7	2502.5-2567.5	22.93	0.44	20	0.043	1
LTE Band 12	699.7-715.3	23.99	1.49	20	0.070	0.466
LTE Band 13	779.5-784.5	23.93	1.66	20	0.072	0.521
LTE Band 25	1850.7-1914.3	23.99	1.56	20	0.071	1
LTE Band 26	814.7-848.3	23.98	3.20	20	0.104	0.546
LTE Band 30	2307.5-2312.5	22.95	2.27	20	0.066	1
LTE Band 41	2498.5-2687.5	22.92	0.44	20	0.043	1

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

1. WLAN 2.4G (Module: WLE600VX) + WLAN 5G (Module: AP6356SDPB) + WWAN LTE Band 4 (Module: EM7455) =  $0.152 / 1 + 0.012 / 1 + 0.072 / 1 = 0.236$
2. WLAN 2.4G (Module: AP6356SDPB) + WLAN 5G (Module: WLE600VX) + WWAN LTE Band 4 (Module: EM7455) =  $0.018 / 1 + 0.181 / 1 + 0.072 / 1 = 0.271$
3. WLAN 2.4G (Module: WLE600VX) + WLAN 5G (Module: AP6356SDPB) + WWAN LTE Band 25 (Module: EM7455) =  $0.152 / 1 + 0.012 / 1 + 0.071 / 1 = 0.235$
4. WLAN 2.4G (Module: AP6356SDPB) + WLAN 5G (Module: WLE600VX) + WWAN LTE Band 25 (Module: EM7455) =  $0.018 / 1 + 0.181 / 1 + 0.071 / 1 = 0.270$
5. WLAN 2.4G (Module: WLE600VX) + WLAN 5G (Module: AP6356SDPB) + WWAN LTE Band 26 (Module: EM7455) =  $0.152 / 1 + 0.012 / 1 + 0.104 / 0.546 = 0.354$
6. WLAN 2.4G (Module: AP6356SDPB) + WLAN 5G (Module: WLE600VX) + WWAN LTE Band 26 (Module: EM7455) =  $0.018 / 1 + 0.181 / 1 + 0.104 / 0.546 = 0.389$

Therefore the maximum calculations of above situations are less than the "1" limit.

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